What is claimed is:

1. A method of inspecting a heat exchanger comprising a plurality of tubes having ends fixed in a tubesheet, comprising the steps of:

establishing a baseline for each tube of its location in the tubesheet and its unique signal pattern resulting at least in part from fixing the tube end in the tubesheet;

obtaining signal pattern data at an elevation proximate a first identified tube;

comparing the signal pattern data obtained for the first identified tube with the baseline signal pattern resulting at least in part from fixing the tube end in the tubesheet for the first identified tube, in order to verify the correctness of the tube identification; and

accepting the obtained signal pattern data if the correctness of the tube identification has been verified by the comparison.

2. The method of Claim 1 wherein the signal pattern is an eddy current pattern resulting at least in part from fixing the tube end in the tubesheet; and wherein the step of obtaining signal pattern data includes the steps of:

inserting an eddy current probe into a first identified tube; and

obtaining eddy current data at an elevation proximate the first identified tube.

3. The method of Claim 2, including the step of:

verifying the correct identification of the first identified tube while the eddy current probe is inserted in the first identified tube.

4. The method of Claim 2 including the step of:

updating the baseline of eddy current patterns based upon the eddy current data obtained proximate the tube, tubesheet interface, after verifying the correct identification of the tube.

5. The method of Claim 2 wherein said step of establishing a baseline includes the step of obtaining eddy current data for each tube selected from the group consisting of voltage, phase and signal pattern.

6. The method of Claim 5 including the steps of:

obtaining eddy current data for the first identified tube that corresponds to the baseline data, including eddy current data selected from the group consisting of voltage, phase and signal pattern; and

comparing at least one of the corresponding voltage, phase and signal pattern obtained for the first identified tube with the corresponding baseline data.

7. The method of Claim 1 wherein the steps of Claim 1 are performed automatically a computer program product.

8. The method of Claim 1 including the step of performing an operation on the identified, verified tube selected from the group consisting of inspecting the tube, repairing the tube or plugging the tube.

9. The method of Claim 1 wherein the heat exchanger is a steam generator for a nuclear power generation station.

10. A method of verifying the identity of an individual heat exchanger tube for inspection of a steam generator for a nuclear power generation station, the steam generator including a plurality of tubes having ends fixed in a tubesheet, the method comprising:

establishing a baseline for each tube of its location in the tubesheet and its signal pattern resulting at least in part from fixing the tube end in the tubesheet;

providing a robotic arm coupled to a portion of the steam generator, the robotic arm including an end-effector with a data retrieval mechanism;

inserting the data retrieval mechanism into a first identified tube;

obtaining signal pattern data at an elevation proximate the first identified tube;

comparing the signal pattern data obtained for the first identified tube with the baseline signal pattern resulting at least in part from fixing the tube end in the tubesheet for the first identified tube, in order to verify the correctness of the tube identification; and

accepting the obtained signal pattern data if the correctness of the tube identification has been verified by the comparison.

11. The method of Claim 10 wherein the unique signal pattern is a unique eddy current pattern resulting at least in part from fixing the tube end in the tubesheet; wherein the data retrieval mechanism is an eddy current probe; and wherein the step of obtaining signal pattern data includes the steps of:

inserting the eddy current probe into the first identified tube; and

obtaining eddy current data at an elevation proximate the first identified tube.

12. The method of Claim 11, including the step of:

verifying the correct identification of the first identified tube while the eddy current probe is inserted in the first identified tube.

13. The method of Claim 11 wherein the verification includes:

comparing at least voltage and signal pattern eddy current data obtained for the first identified tube with the baseline voltage and signal pattern values for said tube.

14. The method of Claim 11 including the step of:

updating the baseline, including the eddy current patterns, based upon the eddy current data obtained proximate the tube, tubesheet interface, for the first identified tube, after verifying the correct identification of said tube.

15. A computer program product which, when implemented by a computer system having a programmable processor, a memory storage device and an output device, instructs the programmable processor of said computer system to execute a process for inspecting a heat exchanger having a plurality of tubes with ends fixed in a tubesheet, the process comprising the steps of:

establishing a baseline for each tube of its location in the tubesheet and its unique signal pattern resulting at least in part from fixing the tube end in the tubesheet;

recording the baseline for each tube in a database within the memory storage device of said computer system;

identifying a first tube;

inserting a data retrieval mechanism into the first identified tube;

obtaining signal pattern data at an elevation proximate the first identified tube;

comparing the signal pattern data obtained for the first identified tube with the baseline data for said tube, which is stored in the database, in order to verify the correctness of the tube identification;

accepting the obtained signal pattern data if the correctness of the tube identification has been verified by the comparison or identifying another tube for comparison if the tube identification has not been verified by the comparison;

updating the baseline data in the database based upon the signal pattern data obtained at the tube, tubesheet interface, for the identified tube after verifying the correct identification of said tube; and

performing an operation on the identified and verified tube.

16. The computer program product of Claim 15 wherein the unique signal pattern is an eddy current pattern rebutting at least in part from fixing the tube end in the tubesheet; wherein the data retrieval mechanism is an eddy current probe; and wherein the step of obtaining signal pattern data includes the steps of:

inserting the eddy current probe into the first identified tube; and

obtaining eddy current data at an elevation proximate the first identified tube.

17. The computer program product of Claim 16 wherein the step of verifying the correct identification of the first identified tube occurs while the eddy current probe is inserted in the first identified tube.

18. The computer program product of claim 16 wherein the verification step includes comparing at least voltage and signal pattern eddy current data obtained for the first identified tube with the baseline voltage and signal pattern eddy current data stored in the database for said tube.

19. The computer program product of Claim 15 wherein said operation performed on the verified tube includes an operation selected from the group consisting of inspecting, repairing and plugging.

20. The computer program product of Claim 16 wherein said output device of said computer system includes at least one computer screen; and wherein the results of the comparison between the eddy current data obtained for the

first identified tube and the baseline eddy current data stored in the database for said tube, are displayed on said at least one computer screen.